

[027] Fig. 1 is a top view of a measuring body with an inventive speed measuring system; [[and]]

[028] Fig.2 is a diagrammatic curve of a speed signal amplitude as a function of an air gap[[.]], and

Fig. 3 is a top view of a measuring body of an inventive speed measuring system employing two speed sensors.

[031] A stationary speed sensor 4 located radially to the toothed disc 1 in this embodiment conventionally detects, for example, inductive, magneto-resistive or via a Hall element, the pulse of the counter toothing 2 during a rotation of the measuring body and provides a speed output signal representing the motion of the counter toothing 2 and thus the rotation of the toothed disk 1. As discussed with respect to the prior art speed measuring systems, and although the speed sensor 4 is located at an initially selected distance from the toothed disc 1, the actual air gap distance between the speed sensor 4 and the toothed disc 1 will vary with time and with rotation of the toothed disc 1 and the variation in the air gap distance will effect the speed output signal of the speed sensor 4, thereby causing errors in the speed output signal. In another development, as illustrated in Fig. 3, the speed sensor 4 can be designed as double sensor 4A and 4B adjacently located along the direction of motion of the counter toothing 2, thus measuring the direction of rotation and/or angularity thereof, together with the speed of the transmitter wheel.

[032] Axially next to the speed sensor 4 and radially above the cylindrical smooth distance measuring surface 3, a distance sensor 5 is located which scans, for example, according to the inductive or magneto-resistive measuring principle, said distance measuring surface 3. According to the invention, in this manner the distance sensor 5 continuously determines an actual air gap distance between speed sensor 4 and measuring body 1 is constantly determined and provides a distance output signal representing the actual air gap distance between the speed sensor 4 and the measuring body 1. In one other development, a change in the air gap distance between the speed sensor 4 and the measuring body 1 will appear as a change in the distance output signal and,

instead of the actual air gap as represented by the distance output signal, ~~[[the]]~~
a change in the actual air gap distance as represented by a change in the
distance output signal change can be used. The actual air gap or the change
in the actual air gap change a represented by the distance output signal or the
change in the distance output signal forms, together with the output signal of the
 speed sensor 4, the input variables of an evaluation device 8 ~~(not shown)~~ of the
 inventive speed measuring system. Said evaluation device 8 can be integrated
 in the speed sensor 4 or in the sensor housing 6, but also in a separate
 (decentered) control unit 10.

[033] To achieve the most compact construction possible, speed sensor 4 and
 distance sensor 5 are situated together in one sensor housing 6 thus forming a
 sort of miniature speed measuring system.

[034] In the evaluation device 8 of the speed measuring system, the ~~actual~~
 output signal of the speed sensor 4 is evaluated, according to the actual air gap
distance represented by the distance output signal of the distance sensor 5, ~~and~~
to form[[s]] an actual speed of the measuring body as represented by an output
 signal of the speed measuring system. The sensor-specific release thresholds
 of the speed sensor 4 are here of essential importance, as will be explained
 herebelow with the aid of Fig. 2.

[035] In Fig. 2 a diagrammatic curve of the speed output signal amplitudes
 (ordinate A) of the speed sensor 4 ~~[[via]]~~ versus the air gap (abscissa LS)
 between stationary speed sensor 4 and rotating measuring body 1 is shown.
 With A_max and A_min, respectively, are designated the maximum and
 minimum speed output signal amplitudes which can result from rotation of the
 measuring body 1. According to the invention, an upper release threshold S_o
 (shown in dotted line) and a lower release threshold S_u (shown in dotted line)
 are coordinated with the speed sensor 4. Both release thresholds S_o and S_u
 are a function of the measured air gap LS. If the ~~actual~~ measured speed output
signal amplitude, that is the magnitude of the speed output signal as provided
by the speed sensor 4, is greater than the lower release threshold S_o or smaller
 than the lower release threshold S_u, the speed sensor 4 delivers a reliable
 speed signal unequal to "zero".

[036] The upper and lower release thresholds S_o, S_u are stored in the

evaluation device 8 (not shown) of the inventive measuring system in the form of characteristic lines specific to the sensor and/or specific to the measuring body as a function of the air gap LS. If the speed sensor 4 now detects an actual movement of the measuring body, as represented by the speed output signal of the speed sensor 4, the movement represented by the speed output signal of the speed sensor 4 is corrected by the evaluation device 8 according to the characteristic line representing the actual air gap distance as represented by the distance output signal from the distance sensor 5 and said movement is issued by the evaluation device 8 of the speed measuring system as an actual speed value of the measuring body 1 only when the required signal amplitude, based on the time-parallel measured air gap, has been quantitatively exceeded. Otherwise, the evaluation device of the speed measuring system issues a "zero" speed.

[037] In another embodiment, the maximum and minimum speed signal amplitudes A_{\max} , A_{\min} can also be stored in the evaluation device of the speed measuring system in the form of characteristic lines specific to the sensor as a function of the air gap LS. In this embodiment the speed output signal from the speed sensor 4 is corrected by the evaluation device 8 according to the characteristic line representing the actual air gap distance as represented by the distance output signal from the distance sensor 5 and In this variant, the minimum value of the actual speed signal amplitude, dependent on the actual air gap LS, is taken into account, for example, as a differential value in relation to the limiting values A_{\max} , A_{\min} of the speed signal amplitudes as a percent deviation from the limiting values A_{\max} , A_{\min} of the speed signal amplitudes. The actual speed signal amplitude can then be smaller at most by a defined differential amount or a defined percent deviation than the respective speed signal amplitudes A_{\max} , A_{\min} in order that the speed measuring system issues a speed value unequal to "zero".